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PHALAEINID NOTES AND DESCRIPTIONS (LEPIDOPTERA)*

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ACONTIINAE

In a revision of the Acontias contained in the Canadian National Collection two species which have been unnamed in the Collection for some time appear to be undescribed. I offer the following descriptions.

Conocharis rectangula n. sp.

Allied to *acuta* Sm. but considerably larger and more heavily marked. Palpi brown, white basally. Front with the prominence less strong than in *acuta*, crossed by a brownish band. Remainder of head and thorax scaled with white, the metathoracic scutellum tinged with purple-gray. Abdomen pale grayish, shaded with white, especially laterally. Primaries with the basal half creamy-white; costa with a small brown spot at $\frac{1}{4}$, joined to base of wing by a fine brown line along costal edge. Outer half of wing purple-gray with the subterminal area largely white in the lower half of wing and with a broad brown band, slightly edged with black, forming the border between the pale and dark areas of the wing. This band is nearly upright but is broken opposite the reniform by a prominent rectangular indentation of the white basal color which attains the reniform. Orbicular absent; reniform upright, purple-gray, weakly and narrowly outlined outwardly with white; beyond reniform a pale brownish shading occupies the area to s. t. line. T. p. line only faintly indicated, curved around reniform and forming the outer margin of the aforementioned brown band in the lower half of wing where it is irregularly dentate. Costa beyond t. p. line somewhat white-shaded. S. t. line white, irregular, fairly distinct in costal half of wing, forming the outer margin of the white subterminal area in lower half. Terminal area purple-gray with broken black terminal line, faintly margined inwardly with white. Fringes brown apically, cut by a white subapical patch; in lower half of wing white with prominent brown patch at tornus. Secondaries white with narrow smoky terminal band and white fringes. Beneath primaries smoky, outer half of costa white cut by a small brown spot; fringes as above. Secondaries entirely white with the merest traces of a dark spot on costa before apex. Expanse 23 mm.

Holotype—♂, Del Rio, Texas, April 25, 1922. No. 5382 in Canadian National Collection.

The very characteristic rectangular white indentation before reniform and the prominently checkered fringes should readily identify the species.

Tarache gonoides n. sp.

Belongs in the group with fovea at base of forewing in male and is allied to *tetragona* Wlk.

Male. Palpi with basal joint white, terminal joints largely brown. Head and thorax white-scaled with grayish band across front and slight gray scaling on metathoracic scutellum, Abdomen largely white, faintly ringed with ochre-brown. Primaries with the white basal half *not clearly and sharply defined* as in *tetragona* but with the inner half suffused with purple-gray, this color blend-

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ing broadly above inner margin with the dark outer area of wing which shows more of an inner angle below reniform than in *tetragona*. A rectangular, brown costal patch at $1/3$, as in *tetragona*, giving rise to a pale t. p. line edged on both sides with gray, and angled inwardly in submedian fold. A similar brown patch on costa above reniform and a white patch beyond it as in *tetragona*. Maculation in outer half of wing almost exactly as in *tetragona*; the reniform more prominent, due to a partial fine outer line of white and some olivaceous central shading. Considerable olivaceous shading on the costal spot, below and beyond the reniform, and along inner edge of s. t. line; balance of area deep purplish-gray. T. p. line indicated below reniform by an irregularly dentate black shade; s. t. line white, quite prominent in lower half of wing, where it angles outward to termen and is roundedly incurved above tornus. Terminal black line, bordered narrowly inwardly with white and slightly cut in apical area by olivaceous streaks on the veins. Fringes purple, more definitely checkered than in *tetragona*, showing a strong white patch below middle of wing and some small white spots subapically, followed outwardly by brownish shades. Secondaries pure white with traces of darker terminal shading in apical region. Fringes white. Beneath, primaries with white costa, light ochreous in cell, and purplish outwardly with narrow pale termen. Fringes as above. Secondaries white.

Female. Almost exactly as *tetragona*. Central portion of thorax with more purplish suffusion; more olivaceous shading in the dark areas of primaries and more decidedly checkered fringes as in the male. Secondaries lightly suffused with pale ochraceous. Expanse 22 mm.

Holotype—♂, Brownsville, Texas, Mch. 13, 1937 (T. N. Freeman) No. 5383 in Canadian National Collection.

Allotype—♀, Brownsville, Texas, Mch. 13, 1937 (T. N. Freeman) No. 5383 in Canadian National Collection.

Tarache bilimeki Feld.

A male specimen before me from Cave Creek, Ariz. (Aug.) matches Hampson's description of *bilimeki* excellently. The species is closely allied to *lanceolata* Grt. but head and tegulae are deep purplish, instead of white: the dark areas of the primaries in the specimen before me are deeper purplish with little trace of the olivaceous shading of *lanceolata*. As far as I know the species has not previously been reported from the United States.

NYCTEOLIDAE

Genus *Nycteola* Hbn. (*Sarrothripus* Curt.)

In this genus our North American forms have for years been listed as varieties or races of the European *revayana* Scop. In working through the group my attention was drawn to articles by Klos and Meixner (1907, Verh. Zool. bot. Ges. Wien. LVII, (173-177) in which it is distinctly shown, on the strength of both larval food-plants (e.g., willow and oak) and male genitalia, that *degenerana* Hbn., long considered a form of *revayana*, was in reality a good species. Hampson (1912, Cat. Lep. Phal. Brit. Mus. XI, 266) mentions this paper but does not follow it in his synonymy.

As our National Collection contained long series of specimens bred from both willow (*Salix discolor*) and poplar (balsam and cottonwood) it seemed, in the light of the results obtained by the above-mentioned authors, that a genitalic study of our North American forms might prove of value. After a comparison of numerous genitalic slides (both male and female) it became evident that not only are our American forms distinct from the European *revayana* Scop. but that no less than three good species are involved, and that the synonymy as given in the recent Check List must be considerably revised, both as to genera and to species.

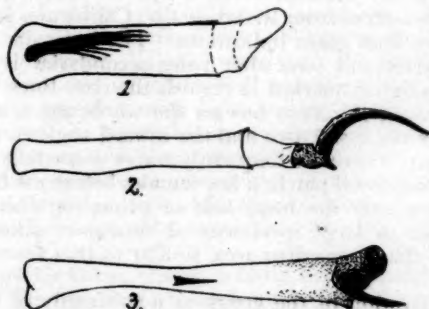
As regards the generic term *Nycteola* Hbn., if one accepts Hemming's

reference to the Alph. Syst. Verz. 1822 (there may be some doubt as to whether the nomenclature in this work is strictly binary), this name will antedate *Sarothripus* Curt. (1824).

The oldest available specific North American name is *frigidana* Wlk., based on material from St. Martin's Falls, Albany Riv., Ont. This evidently applies to our dark-gray, willow-feeding species of eastern Canada and, as far as I can tell, *scriptana* Wlk. (Mass.) and *lintnerana* Spey. (N. Y.) will fall into the synonymy.

The male genitalia are very complicated; the most easily recognizable characters are found in the aedeagus. In *frigidana* (Fig. 1) this organ is shorter and broader than in the other two species and entirely lacks the curved apical spine of *revayana* (vide Meixner's illustration) but has instead a proximal cluster of small cornuti, which spread out fan-shaped apically.

Apart from the normal, fairly evenly deep gray type, two other varieties of the maculation of the forewings occur commonly. In the one there is considerable pale greenish (or bluish-green) suffusion in a broad antemedian band and also on costa before apex; it is possible that Walker's name, *favillana*, based on material from an unknown locality, may apply to this. In the other there is considerable blackish suffusion at base of wing and in the median area, the



Aedeagus of (1). *N. frigidana* Wlk. (2). *N. columbiana* Hy. Edw. (3). *N. cinereana* N. & D.

latter being broken up into a larger, bluntly triangular, costal patch and a small, irregular shade, attached to the t. a. line above inner margin. Possibly *scriptana* Wlk. may be available for this form.

Frigidana occurs across the entire Dominion of Canada. Specimens bred from willow-feeding larvae are before me from Nova Scotia (Baddeck, S. Milford); Quebec (Gracefield, Norway Bay, Burbidge); Ontario (Blackburn); and the collection also contains a few specimens from Manitoba (Aweme) and Alberta (Sundre). In the lower Fraser Valley of British Columbia and on Vancouver Is. a larger, paler race occurs to which I apply the name *BRITANA* var. nov. to distinguish it from the somewhat similarly colored *columbiana* Hy. Edw. The general ground-color of primaries is pale greenish or bluish-gray with the basal area and the costal half of the median area strongly suffused with deep black-brown; the cross-lines are distinct and the reniform is well defined as a round, brownish spot. The Holotype is a male from Departure Bay, Vancouver Is. B. C., Aug. 18. (C. H. Young); No. 5384 in Canadian National Collection. Other specimens are before me from Vancouver, Popcum, Duncan, Wellington and Cowichan Bay, B. C.

Columbiana Hy. Edw. which is only known to me from Vancouver Is. localities, is a good species with male genitalia distinct in many particulars from

frigidana. The aedeagus (Fig. 2) is long and thin and the basal patch of cornuti is lacking; instead there is a long, strong, sickle-shaped, apical spine, much longer than in Meixner's illustration of the aedeagus of *degenerana* and without such a prominent basal membranous flap. The general light-green coloration of primaries with prominent black cross-lines, especially the s. t. line, is characteristic; in addition a round black antemedian spot near base of cell, which seems to be lacking in *frigidana* forms, might be mentioned as a distinguishing character. I know of no record of the larval food-plant.

For the third species in the group the name *cinereana* N. & D. seems available. This was based on what was termed the gray form of *columbiana*, occurring in the Pacific North West, but the genitalia show it to be a distinct species. The long, thin aedeagus (Fig. 3) is armed with a curved apical spine, slightly longer than that of *degenerana* and arising from a strongly chitinated base; there is also a single fine cornutus in the median section of the organ. Besides a series of specimens from the Summerland region of Central B. C., bred from larvae on cottonwood, our Collection contains a long series bred from balsam poplar at Norway Bay, Que., a location on the Ottawa river above Ottawa. It is probable, therefore, that when more collecting and breeding is done, the range of the species will be found to be transcontinental. In the west the species evidently extends down the entire coast of the United States as we possess a few specimens from Riverside Co., California, bred by Commander Dammers but without food plant indications. The large size (27-31 mm), paler gray color of primaries and somewhat paler secondaries is characteristic. In general the species is lightly marked as regards the cross-lines; the course of these is very similar to that of *frigidana* but on the whole the t. a. line seems somewhat more upright in the costal area and the inward angle of the t. p. line in the fold somewhat sharper. There are frequently traces (especially in our eastern series) of the dark median costal patch; a few females before me from southern B. C. show a dark suffusion over the basal half of primaries which gives them considerable resemblance to large specimens of *revayana*; other B. C. specimens show a lightening of the antemedian area, similar to that found in the analogous form of *frigidana*.

The present position of the group as a subfamily of the Phalaenidae is extremely doubtful. The whole genitalia are quite un-phalaenid-like; the greatly reduced uncus, the long, thin, U-shaped vinculum, and the numerous tufts of specialized hair and spines are, in fact, somewhat reminiscent of the Phycids. European authors usually place the group somewhere near the Nolidae and this after all may be a better place for it. As regards the few North American genera at present—following Hampson—placed in the subfamily, *Characoma* Wlk. seems the only one that is definitely allied to *Nycteola*. *Baileya* Grt., apart from its bar-like retinaculum, shows no similarity, either in genitalia or in the position of vein 5 of the secondaries; it is, however, a Phalaenid, but its correct position remains a mystery to me at present. I have had no opportunity of examining specimens belonging to *Casandria* Wlk. *Comachara* Franc., judging by material from Nantucket, Mass. of *cadburyi* Franc., received through the kindness of Mr. C. P. Kimball, seems quite misplaced in its present association. I can find no trace of ocelli and this lack, together with the bar-shaped nature of the retinaculum, would incline one to place the genus for the present in the Lithosiinae, somewhere close to *Afrida* Moesch. which has also been a stumbling-block to taxonomists.

Incidentally, in connection with the genus *Characoma* Wlk. the correctness of the name *nilotica* Rogenh. as applied to our North American species will have to be investigated. In the light of the results obtained in the *Nycteola* species I have my suspicions that our American species, presumably a feeder in willow-galls, will not be identical with an Egyptian species feeding on tamarisk.

NEW SPECIES OF *PARASYNTORMON* FROM THE UNITED STATES
(DIPTERA, DOLICHOPODIDAE) *BY F. C. HARMSTON AND G. F. KNOWLTON,
Logan, Utah

The four species of flies here described as new belong in the genus *Parasyntormon* as established by Wheeler in 1899. Curran and Becker, among the more recent writers, have pointed out the very close relationship of *Parasyntormon* to *Syntormon* Loew, the latter writer having united the two genera under the name *Syntormon*. Van Duzee has maintained each as a distinct genus, using the structure of the face in the female as a basis for the separation. Since females of a number of the species are unknown, it would seem wise to maintain the genus *Parasyntormon*, at least until such time as more is learned regarding the several species in question.

Parasyntormon appendiculatus n. sp.

Male. Length 2.4 mm.; of wing 2 mm. Face brown, appearing more golden in certain views widest immediately below antennae, narrowed on lower portion, where the eyes are nearly approximated. Front dull green, overlaid with brown pollen. Palpi and proboscis yellow. Inferior postocular cilia pale, with about the six uppermost cilia black. Antennae yellow; the second joint narrowly at tip, and the third joint on apical two-thirds, darkened; third joint approximately same length as the first joint, obliquely truncate at apex; arista inserted at base of third joint, slightly longer than the antenna.

Dorsum of thorax and scutellum dull metallic green, thickly dusted with brown pollen; pleurae greenish, with light coating of white pollen. Abdomen black, with cupreous reflections, club-shaped; second and third segments yellow, darkened on distal portion and along median dorsal line. Hypopygium black; inner lamellae blackened, consisting of a pair of tubular organs, fringed with delicate cilia; outer lamellae yellowish, approximately same length as inner lamellae, fringed with conspicuous brownish cilia, the latter appearing pale in some lights.

Fore and posterior coxae yellow; middle coxae concolorous with pleurae; anterior surfaces of fore coxae with scattered black hairs and the usual black bristles at tip. Femora and tibiae yellow; fore femora with a row of four delicate, yet prominent, pale cilia near base on lower edge; middle and posterior femora of plain structure. Fore tarsi yellow, with exception of fifth joint, which is black and conspicuously broadened dorso-ventrally, forming a somewhat spatula-like tip; first joint bearing a row of sharp, short, closely-spaced bristles on plantar surface; second joint not incrassated (a rather remarkable character for a member of this genus); middle and hind tarsi of plain structure, gradually darkened from the tip of first joint. Joints of fore tarsi as 10-5-5-5-4; of middle tarsi as 15-6-5½-5-3; of posterior tarsi as 8-10-7-5-4. Calypters and halteres pale yellow, the former with narrow black tip and brownish cilia. Wings hyaline, grayish, narrowed toward the base; fourth vein parallel with fifth from beyond its basal third; length of posterior cross-vein as 5, length of last section of fifth vein as 17.

Female. Face wider than in male; fore tarsi of plain structure, with fourth and fifth joints darkened; third antennal joint small, nearly orbicular; otherwise similar to the male in color of body and legs.

Described from four males and one female, all taken at Manila, Utah, July 17, 1940, by G. F. Knowlton and F. C. Harmston. Holotype and allotype to be deposited in the U. S. National Museum; paratypes in the collection of the Utah Agricultural Experiment Station.

Taxonomy: *Parasyntormon appendiculatus* n. sp. closely resembles *P. occidentalis* (Aldrich), the latter having been described in *Sympycnus*, (Kansas

*Contribution from the Department of Entomology, Utah Agricultural Experiment Station.

Univ. Quart., 2:153, 1894). The first joint of fore tarsi in *occidentalis* bears two prominent black bristles on the lower surface near base, instead of the row of short, closely placed bristles along entire lower surface which occurs in *appendiculatus*; the second joint of fore tarsi in *occidentalis* is swollen and the fifth joint is of plain, cylindrical form which are additional distinguishing characters.

***Parasyntormon nigripes* n. sp.**

Male. Length 2.2 mm.; of wing 2 mm. Face rather wide, dull brownish pollinose. Front, proboscis and palpi black. Inferior postocular cilia pale; cilia on upper portion of orbit black. Antennae black; first joint rather broad; second joint overlapping the third joint on inner surface with a short, broad, thumb-like lobe; third joint as long as the posterior basitarsus, pointed, densely pubescent, quite evenly rounded below yet with the suggestion of an angle near middle; arista inserted near middle of third joint and equalling it in length.

Dorsum of thorax and the pleurae black, the latter somewhat greenish in ground color, lightly dusted with white pollen. Abdomen and hypopygium black, metallic. Hypopygial lamellae brownish, fringed with prominent pale cilia, narrow, approximately the same length as third antennal joint.

Coxae and all of legs, including the tarsi, black. First joint of fore tarsi with a few prominent bristles on plantar surface; second joint distinctly swollen, as is the case in most males of the genus; remaining joints of fore tarsi, and all joints of the middle and hind tarsi are of plain structure. Joints of fore tarsi as 7-3-3-3-3; of middle tarsi as 11-5-4½-4-4; of hind tarsi as 6-10-5-4½-3. Halteres pale; calypters pale with black margin, their cilia black.

Wings broad, widest opposite the tip of fifth vein; anal angle prominent, evenly rounded; crossvein one-fourth the length of distal portion of fifth vein, the comparative lengths as 4:16.

Described from one male taken at Little Salt Lake, Iron County, Utah, May 7, 1939, by G. F. Knowlton and F. C. Harnston. Holotype to be deposited in the U. S. National Museum.

Taxonomy: *Parasyntormon nigripes* n. sp. is readily distinguishable from described species of the genus because of the uniformly black color of body and legs, together with the arista being inserted slightly before the middle of third antennal joint.

***Parasyntormon classicus* n. sp.**

Male. Length 2.4 mm.; of wing 2.2 mm. Face moderately wide, silvery pollinose. Front black, lightly dusted with white pollen. Palpi and proboscis blackish. Antennae black; third joint as long as middle basitarsus, its upper and lower edges parallel to about the middle, at which point there is a prominent angle from which the lower edge tapers to a sharp point; arista apical, about one-half the length of third joint. Inferior postocular cilia pale, the upper cilia black.

Dorsum of thorax, pleurae, scutellum and the first abdominal segment metallic greenish, lightly dusted with white pollen. Second and third segments of abdomen and the hypopygium blackish with cupreous reflections. Outer hypopygial lamellae yellowish, as long as last section of fifth wing vein, fringed with conspicuous pale cilia; inner lamellae black.

Fore coxae yellow, blackened on basal third; middle and posterior coxae concolorous with pleurae. Femora and tibiae yellow; posterior femora and tibiae narrowly blackened at tip on upper edge. Tarsi blackened from the tip of first joints; fore basitarsi with three prominent bristles on lower surface near basal third; second joint incrassated. Joints of fore tarsi as 8-4-3-3-3; of middle tarsi as 12-6-5-4-3; of posterior tarsi as 6-8-5-4-3. Calypters and halteres yellow, the former with black margin and brownish cilia.

Wings grayish hyaline, veins blackish, scarcely narrowed toward base;

comparative lengths of posterior crossvein as 4, the last section of fifth vein as 11.

Described from four males, taken at Bluff, San Juan County, Utah, by G. F. Knowlton and F. C. Harmston. Three were taken on August 20, 1938; the other specimen, which is the holotype, was collected May 21, 1938. Holotype to be deposited in the U. S. National Museum; paratypes in the insect collection of the Utah Agricultural Experiment Station.

Taxonomy: *Parasyntormon classicus* n. sp., is much like *mulinum* Van Duzee in the color of legs and body and the structure of the antennae. The two species are readily distinguishable, however, by the comparative lengths of the hypopygial lamellae. In *classicus* the outer lamellae are approximately the same length as the last section of fifth vein, whereas in *mulinum* the outer lamellae measure only as long as the posterior cross-vein. The long, pointed, ribbon-like lamellae are excellent distinguishing characters in the case of *classicus*, as no other known member of the genus has a similar development of structures.

Parasyntormon virens n. sp.

Male. Length 2.2 mm.; length of wing 2 mm. Face wide for a male, silvery pollinose. Front dull greenish, dusted with white pollen. Palpi and proboscis dark brown. Inferior postocular cilia pale; about five of the upper cilia black. Antennae black; second joint overlapping third on inside with a narrow thumb-like lobe; third joint pointed, same length as the second joint of posterior tarsi, elongate-triangular, evenly tapering from the base on lower and upper edges; arista distinctly pubescent, inserted at extreme base of third joint, as long as antenna.

Dorsum of thorax, pleurae, scutellum and first abdominal segment metallic greenish, dulled with white pollen. Second and third segments of abdomen yellow, the posterior margin and the dorsal median line greenish; remainder of abdomen and the hypopygium concolorous with thorax. External hypopygial lamellae yellow, narrow, as long as middle basitarsus, fringed along edges with conspicuous, brownish cilia; inner lamellae black. Fore and hind coxae yellow, the former with pale hairs on anterior surfaces and black bristles at tips; middle coxae concolorous with pleurae. Femora and tibiae yellow, of plain structure; posterior femora blackened on upper edge at extreme apical portion; tarsi yellowish, becoming gradually darker toward apices; fore basitarsus with three bristles on basal third of plantar surface, second joint incrassated, third joint bearing a hook-like bristle near base on lower, inner side. Joints of fore tarsi as 8-3-3-2½-2½; of middle tarsi as 11-5-5-3-3; of posterior tarsi as 6-8-5-4-3. Calypters and halteres pale yellow, the former with blackened apical margin and brownish cilia.

Wings grayish hyaline, scarcely narrowed basally; veins brownish; comparative lengths of posterior cross-vein as 4, the last section of fifth vein as 13.

Female. Like the male in general color of legs and body; fore tarsi of plain structure; face wider; third antennal joint scarcely longer than broad.

Described from five males and one female, all taken at the Henry Mountains, about 15 miles south of Hanksville, Wayne County, Utah, June 6, 1940, by G. F. Knowlton and F. C. Harmston. Holotype and allotype to be deposited in the U. S. National Museum; paratypes in the insect collection of the Utah Agricultural Experiment Station.

Taxonomy: *Parasyntormon virens* n. sp. is the only known member of the genus possessing wholly black antennae, with elongated third joint having the arista inserted at extreme base, together with yellow coxae and femora. *P. longicornis* Van Duzee, from Oregon, has basally inserted arista and elongated third antennal joint; however, in the latter species the first joint of antennae is yellow below at tip, and the third antennal joint is obliquely truncate at apex.

A REVIEW OF THE CANADIAN SPECIES OF *ERNESTIA* SENS. LAT. (TACHINIDAE, DIPTERA) *

BY A. R. BROOKS,
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The following summary of *Ernestia* sens. lat. of American authors covers the same ground as the summary by Tothill in 1921. The group may be characterized by the following characters that the species have in common: large, robust species, blue-black in color with grey pollen, a few with red-tipped abdomen; 8 to 15 mm. long; eyes haired; palpi long and well developed; vertex of varying width, two proclinate and one reclinate orbital in the females, orbitals only in the males of *Mericia aldrichi* TT. and *Okanaganian setifrons* n. sp., frontal bristles one to six below the antennae bases, strong and decussate; ocellars proclinate, weak to strong; one to three post-acrostichals, three or four post-dorsocentrals, three or four lateral scutellars, apical scutellars present and decussate in our American species. Wings with apical cell open far before the wing tip, a short stump at the cubitulus present or absent. Legs stout, the female front tarsus widened and flat except in *Appendicia* Stein, claws long in the male, shorter in the female. Abdomen as wide or wider than the thorax, robust, bearing marginals and discals on the intermediate segments, the first segment without bristles except in *Ernestia* sens. str. and abnormally in *E. nigrocornea* Tll.; abdominal setae strong in the Linnaemyiine genera, weaker in the Ernestiine genera; prosternum bare; sternites broadly exposed; forceps in the male fused, with or without a strong carina and usually with a leaf-like expansion at the base; female with a general type of larvipositor.

A short history of this group in America might shed some additional light on the classification adopted in this paper. The Aldrich catalogue, following Coquillett, used three genera, namely *Meriania* RD. (*chalybaea* Cq.), *Metaphyto* Cq. (*genalis* Cq.), and *Panzeria* RD. (*flavicornis* B., *penitalis* Cq., *ruficauda* BB., and *radicum* F.). Between 1905 and 1921 Townsend erected three genera, *Melinocera* (*chalybaea* Cq.), *Okanaganian* (*hirta* TT.), and *Pyraustomyia* (*penitalis* Cq.).

In 1921 Tothill added a large number of species to the complex, using male genitalia as his chief character. His views may be summarized as follows:

Genus *Ernestia* RD. (*Erigone* RD., *Mericia* RD., *Platychira* R., *Varichaeta* Sp., *Panzeria* RD., *Okanaganian* TT., *Melinocera* TT., *Meriania* RD., *Fausta* RD.). The genus was divided into four subgenera as follows:

Subgenus 1. *Meriania*. Separated by the absence of discals on the second abdominal segment and generalized male genitalia. All included species have discals however; equals *Meriania* plus *Pseudomeriania* plus *Melinocera* of this paper.

Subgenus 2. *Fausta*. Separated by the presence of discals, wide parafacials and generalized male genitalia; equals *Fausta* of this paper.

Subgenus 3. *Metaphyto*. Separated by discals present, wide parafacials, and specialized male genitalia; equals *Metaphyto* plus *Okanaganian* of this paper.

Subgenus 4. *Ernestia*. Separated by discals present, parafacials narrow, genitalia both generalized and specialized; equals *Ernestia*, *Mericia*, *Appendicia*, and *Promericia* of this paper.

In 1924 Curran attempted to divide the genus into two, *Ernestia* and *Mericia*. The two were separated on: lateral plates of the postscutellum bare, and the male genitalia simple in *Ernestia*, these plates setose and forceps of the male specialized in *Mericia*. *Metaphyto*, with specialized genitalia and lateral plates bare, was placed with *Ernestia*. This arrangement placed Tothill's *Meriania* and *Metaphyto* in *Ernestia*, with all the rest of Tothill's species except *frontalis* in *Mericia*. In 1934 his manual contained the following four genera:

*Contribution No. 2180, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

T.

1. *Mericia*. equals *Mericia* plus *Promericia* of this paper.
2. *Ernestia*. equals *Ernestia* plus *Melinocera* plus *Appendicia* of this paper.
3. *Meriania*. equals *Meriania* plus *Pseudomeriania* of this paper.
4. *Metaphyto*. equals *Metaphyto* plus *Okanaganian* of this paper.

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Townsend in his manual has placed *Fausta*, *Varichaeta*, and *Mericia* in the tribe Linnaemyiini; *Ernestia*, *Meriania*, *Okanaganian*, *Metaphyto* and *Melinocera* in the tribe Ernestiini; *Ostracophyto* and *Appendicia* in the Cuphoceratini. This summary follows Townsend in the recognition of genera except that *Varichaeta* is placed as a synonym of *Mericia*, as the genotype of *Mericia* (*erigonea* RD.) is not well known and is doubtfully distinct generically from the rest of the species. *Ostracophyto* is included in the key as the species *O. aristalis* TT. has many characters in common with the other genera.

List of Canadian species of *Ernestia* sens. Tothill; the genera arranged in order of relationship.

Cuphoceratini.....	<i>Ostracophyto</i> TT. (<i>Ostracophyto aristalis</i> TT.) <i>Appendicia</i> Stein (<i>Ernestia frontalis</i> Tll., <i>Ernestia solita</i> Rnh.)
Linnaemyiini.....	<i>Fausta</i> RD. (no American species) <i>Mericia</i> RD. (<i>Hystricia aldrichi</i> TT. <i>Ernestia bicarina</i> Tll. <i>Tachina ampelus</i> Wlk. <i>Mericia alberta</i> Cn. <i>Mericia manitoba</i> n. sp. <i>Ernestia platycarina</i> Tll. <i>Mericia occidentalis</i> n. sp. <i>Ernestia incisa</i> Tll. <i>Ernestia nigropalpis</i> Tll. <i>Ernestia arcuata</i> Tll. <i>Mericia campestris</i> Cn. <i>Mericia triangularis</i> Cn. <i>Ernestia sulcocarina</i> Tll. <i>Ernestia johnsoni</i> Tll. <i>Ernestia longicarina</i> Tll.) <i>Promericia</i> n. gen. (<i>Mericia fassiventris</i> Cn.)
Ernestiini.....	<i>Ernestia</i> RD. (no American species) <i>Melinocera</i> TT. (<i>Meriania chalybaea</i> Cq., <i>Panzeria flavicornis</i> B.) <i>Meriania</i> RD. (no American species) <i>Pseudomeriania</i> n. gen. (<i>Ernestia nigrocornea</i> Tll.) <i>Metaphyto</i> Cq. (<i>Metaphyto genalis</i> Cq.) <i>Okanaganian</i> TT. (<i>Okanaganian hirta</i> TT. <i>Okanaganian setifrons</i> n. sp.)

The following species described under *Ernestia* have not been placed or belong elsewhere:

- Panzeria penitalis* Cq. (1897). This species is the genotype of *Pyraustomyia* TT. of the tribe Aphriini.
- Ernestia frioensis* Rnh. (1921). This species has been placed in *Macromeigenia* TT. of the Exoristidae by Reinhard (Ent. News XLI, 262).
- Erigone ruficauda* BB. (1898, Sitzungsbericht d. K. Akad., CVII).
- Ernestia fissicarina* Tll. (Can. Ent., LIII, 274, 1921). The very wide front, narrow parafacials, two lateral scutellars and unspecialized male genitalia place this species outside the limits of the genera summarized.

KEY TO GENERA

The abbreviations used in the following keys and descriptions are taken

from Townsend's manual, namely PRI (preintraalar of Townsend or sublateral of Curran), and PRSA (presupraalar of Townsend or presutural plus posthumeral of Curran).

1. Median marginals present on the first abdominal segment; male vertex one-ninth head width, female one-third same; parafacials narrow; hind PRI absent; two PRSA; four post-dorsocentrals; four lateral scutellars and decussate apical pair; forceps of male long, not carinate (*Panzeria* RD.)
Ernestia RD. 2
 No marginals on the first segment or scattered and weak 2
2. Lateral plates of the postscutellum setose; three post-acrostichal bristles; three or four post-dorsocentrals; forceps short and with a carina; hind PRI absent 3
 Lateral plates bare 4
3. Either three post-dorsocentrals or spaced for three; head height nearly equal to head width; parafacials over two-thirds clypeal width and steep sloped; cheek one-half eye height; front PRSA absent; male vertex over one-third head width *Promericia* n. gen.
 Either four post-dorsocentrals or spaced for four; head height obviously less than head width; parafacials less than two-thirds clypeal width and only moderately sloped; cheek less than one-half eye height; front PRSA present; male vertex one-seventh to one-fourth head width (*Erigone* RD., *Varichaeta* Sp.) *Mericia* RD.
 4. Both arisal joints elongate; third antennal segment four or five times the length of the second; three lateral scutellars, apical scutellars weak and divaricate *Ostracophyto* TT.
 At most the second arisal segment long; third antennal segment not over twice second 5
5. Two sternopleurals; pleura and parafacials with long yellow hair; forceps long, not carinate (*Platychoira* R.) *Meriania* RD.
 Three sternopleurals; pleura with black hair 6
6. One strong post-acrostichal; three lateral scutellars; three post-dorsocentrals; species black with parafacials and parafrons densely pollinose; forceps in the male short and with a carina 7
 Two or three post-acrostichals; three or four lateral scutellars; forceps in the male with carina; orbitals present in the male; abdomen wholly shining black; parafrons and parafacials shining black, only thinly pollinose *Okanaganian setifrons* n. sp.
 Two or three post-acrostichals; four lateral scutellars; parafacials, parafrons, and abdomen conspicuously pollinose; forceps in the male long, not carinate 8
7. Parafacials as wide as the clypeus; discals weak or absent on the second abdominal segment; abdomen thinly pollinose *Metaphyto* Cq.
 Parafacials two-thirds clypeal width; discals stronger; abdomen shining black *Okanaganian* TT.
8. Three post-acrostichals, the front one shorter; frontal profile arcuate to flat; parafacials at most two-thirds clypeal width; male vertex not over one-fifth head width; antennae wholly orange *Melinocera* TT.
 Two post-acrostichals; front broad and flat; parafacials from two-thirds to fully as wide as the clypeus; male vertex one-fourth or more of head width; antennae black 9
9. Costal spine strong and longer than R_6 ; female front tarsus not widened; cheek one-third eye height; parafacials two-thirds clypeal width, bare; hind PRI present *Appendicia* Stein
 Costal spine short; female front tarsus widened; cheek three-fifths eye height 10

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10. Parafacials as wide as clypeus, black haired; short stump at cubitulus; long apical scutellars; two PRSA; three frontal bristles below the antennae bases *Pseudomeriania* n. gen.

Parafacials two-thirds as wide as the clypeus; long stump at the cubitulus; apical scutellars absent or micro; one PRSA; six bunched frontals below the antennae bases. (*Echinosoma* Girsh., *Echinosomopsis* TT.)

..... *Fausta* RD.
Ernestia RD. (type *rudis* F.), *Fausta* RD. (type *nemorum* M.), and *Meriania* RD. (type *puparum* F.) are European genera not as yet represented by described species in North America. I have seen no specimens of *Fausta* and the genus was placed in the key from the description only.

Promericia n. gen.

(fig. 4, 17)

Genotype, *Mericia fasciventris* Curran, Ent. News, 35:248, 1924.

Length 10 to 13 mm. Robust, black with grey pollen. Head but little wider than high, frontal profile broad and flat; male vertex one-third head width, female over one-third; frontalia equibroad and one-half as wide as vertex; no orbitals in the male; outer vertical not developed in the male; frontal bristles extending two below the antenna base; parafacials at least two-thirds clypeal width, bare, equibroad and steep sloped; cheek one-half eye height; eyes long haired; epistoma strongly warped forward; antennae extending nearly to the decussate vibrissae, the second segment two-thirds of the third; palpi cylindrical and projecting beyond the epistoma. Acrostichals 2, 3; dorso-centrals 3, 3; front PRSA absent; hind PRI absent; three lateral scutellars and long decussate apical scutellars; lateral plates of the postscutellum setose. Apical cell of the wing widely open before the wing tip; short stump at the cubitulus; M_3 sinuate, much nearer the cubitulus; costal spine small. Abdomen with one discal pair on segments two, three and four, one marginal on segment two, and marginal row on segments three and four. Female front tarsus widened. Male forceps with a carina; female fused sternites 6 and 7 without a groove.

The species *fasciventris* shows relationship with *Mericia*, differing in wide vertex, wide parafacials, 1 PRSA, etc. The allotype female in the Canadian Collection is *Mericia ampelus* Wlk., the true female differing from *ampelus* as shown in the generic key. In the Canadian Collection *fasciventris* is represented by specimens from Quebec, Ontario, and British Columbia.

Appendicia Stein

(fig. 5, 20).

1924, Tach. Mitteleur., 54; one species as *Tachina truncata* Zetterstedt.

The genus *Appendicia* has not been recorded in North America heretofore. *Ernestia frontalis* Tothill (Can. Ent., 53, 228, 1921) and *Ernestia solita* Reinhard (Bull. Brooklyn Ent. Soc., XXXII, 69, 1937) key to this genus in Townsend's manual and agree with his description of that genus in possessing a broad flat front, wide parafacials, elongate second arisal segment, hind PRI present, long costal spine, female front tarsus narrow and so on, differing in possessing two PRSA and having but one discal pair on the intermediate abdominal segments. *Ernestia solita* was originally compared to *nigrocornea* Tll. by Reinhard but is close to if not the same as *frontalis*. I place the two species in *Appendicia* without having seen specimens of *truncata*.

Pseudomeriania n. gen.

Genotype, *Ernestia nigrocornea* Tothill, Can. Ent., 53:227, 1921.

Length 10 to 13 mm. Black, grey pollinose margins of abdomen. Head one-fifth wider than high, flat frontal profile little sloped, slightly longer than facial; clypeus longer than wide, slightly depressed; epistoma warped forward

but not beyond the vibrissae; facialia strongly and densely bristled next the vibrissae; oral margin axis nearly as long as the antennal axis; haustellum less than half head height, labellum small; palpi long, slightly enlarged apically; antennae short, the third segment twice the second and truncate at the tip, arisa bare, joints short; eye pilose; vertex one-third head width in the male, four-tenths in the female; frontalia as wide as parafrontals; no orbitals in the male; parafacialia as wide as the clypeus, black haired; frontal bristles three below the antenna base, strong, ocellar bristles strong, proclinate; cheek three-fifths eye height. Acrostichals 2, 2; dorsocentrals 3, 4; hind PRI absent, 2 PRSA, four lateral scutellars and decussate apical pair, three or four sternopleurals; lateral postscutellar plates and prosternum bare. Wing with apical cell open before wing tip, short stump at the cubitulus, no costal spine. Female front tarsus broad. Abdomen robust, bristles fine; no bristles on the first segment; one marginal on the second, marginal row on the third and fourth, discals on intermediate segments; sternites visible. Male forceps long, fused, not carinate; accessory plates broad triangular.

This genus is related to *Meriania* RD., differing in broad flat front, small labellum, one PRI, black haired parafacialia and pleura, three sternopleurals as well as minor characters. One species occurs in Canada.

***Pseudomeriania nigrocornea* (Tll.)**

(fig. 7, 22)

1921, *Ernestia* (*Meriania*) *nigrocornea* Tothill, Can. Ent., 53:227.

1924, *Ernestia* (*Faustar*) *fasciata* Curran, Ent. News, 35:246; new synonymy.

1930, *Meriania septentrionalis* Curran, Jr., N. Y. Ent. Soc., XXXVIII, 75; new synonymy.

The synonymy of this species was established through the kindness of E. S. Ross of the Californian Academy of Science who compared specimens of *fasciata* with the *nigrocornea* type and pronounced them to be the same. The type of *nigrocornea* is a damaged specimen from California, the types of *fasciata* and *septentrionalis* are in the Canadian Collection. Also in the Collection are specimens from British Columbia (Penticton, Agassiz, Vernon, Creston, Cranbrook), Saskatchewan (Saskatoon), and Ontario (Lake Abitibi).

***Melinocera* TT.**

1915, Townsend, Proc. Biol. Soc. Wash., XXVIII, 22; one species as *Meriania chalybaea* Cq.

This genus is closely related to *Ernestia*, differing chiefly in the characters given in the key. The two species in the Canadian Collection have bright orange antennae, and may be separated as follows:

Vertex of male one-ninth head width; parafacialia haired to near lowest fourth of the eye *chalybaea* (Cq.)
Vertex of male one-sixth head width; parafacialia haired only next the frontalia *flavicornis* (B.)

***Melinocera flavicornis* (B.)**

1898, *Panzeria flavicornis* Brauer, Sitzungsbericht d. K. Akad., CVII, 532.

1905, *Panzeria flavicornis* B. of Aldrich Cat., 453.

1921, *Ernestia* (*Meriania*) *flavicornis* B. of Tothill, Can. Ent., 53:226.

This rather common species is represented in the Canadian Collection by specimens from British Columbia (Trinity Valley, Cranbrook, Vernon, Canim Lake); Alberta (Waterton); Ontario (Lake Abitibi); New Brunswick (Newcastle, St. Stephens).

***Melinocera chalybaea* (Cq.)**

1902, *Meriania chalybaea* Coquillett, Proc. U. S. Nat. Mus., XXV, 119; male and female, Moscow, Idaho.

1921, *Ernestia* (*Meriania*) *chalybaea* Cq. of Tothill, Can. Ent., 53:204.

This species seems to be rare in Canada, and the Collection has only one male from British Columbia.

Okanagania TT. and Metaphyto Cq.

Okanagania Townsend (Can. Ent., XLVII, 289, 1915; genotype *O. hirta* TT.) and *Metaphyto* Coquillett (Rev. Tach., 36, 1897; genotype *M. genalis* Cq.), may well be considered together. Tothill pronounced the two species to be the same, and while they are distinct specifically it is doubtful if the characters for their separation are large enough to be generic. In the Canadian Collection *Okanagania hirta* TT. is represented by a large number of specimens from British Columbia, and *Metaphyto genalis* Cq. is represented by specimens from Utah, Alberta (Medicine Hat), and Saskatchewan (Saskatoon).

The affinities of *setifrons*, described below, are not clear as it has orbitals in the male, four lateral scutellars and two or three post-acrostichals. In head form, chaetotaxy (except as described) and male genitalia it is very like *hirta*, and at present is best considered to be an atypical species of *Okanagania*.

***Okanagania setifrons* n. sp.**
(fig. 21)

Male. Length 9 mm. Antennae and palpi black; vertex over one-third head width; parafrons with two proclinate orbitals; parafrons, parafacials, cheeks and occiput shining black with thin grey-green pollen. Mesonotum and pleura wholly black; three post-acrostichals, and three post-dorsocentrals; scutellum with four lateral scutellars, black with posterior half red. Legs black. Squamae white with brown border; halteres small and grey. Abdomen wholly black, not pollinose; one strong discal and one marginal on segments two and three, one discal and one marginal row on segment four. Genitalia shining black, forceps carina broad and short, lower forceps projection flattened; accessory processes wide on the basal half, narrowed apically.

Female. Except for the secondary sexual characters the female is similar to the male. One female from the Great Sand Hills region of Saskatchewan is similar except it has only three lateral scutellar bristles.

Holotype. ♂, Osoyoos, B. C., 24.IV.1927 (E. R. Buckell); no. 5330 in the Canadian National Collection, Ottawa.

Allotype. ♀, Nicola, B. C., June 24, 1927 (H. L. Seamans).

Paratypes. 1 ♂, Idaho, May 1, 1919 (E. H. Quayle), 1 ♀, Great Sand Hills, Sask., 27.V.1939 (A. R. Brooks).

Mericia RD.

1830, *Mericia* Robineau-Desvoidy, Ess. Myod., 64; type *M. erigonea* RD.

1830, *Erigone* Robineau-Desvoidy, Ess. Myod., 65.

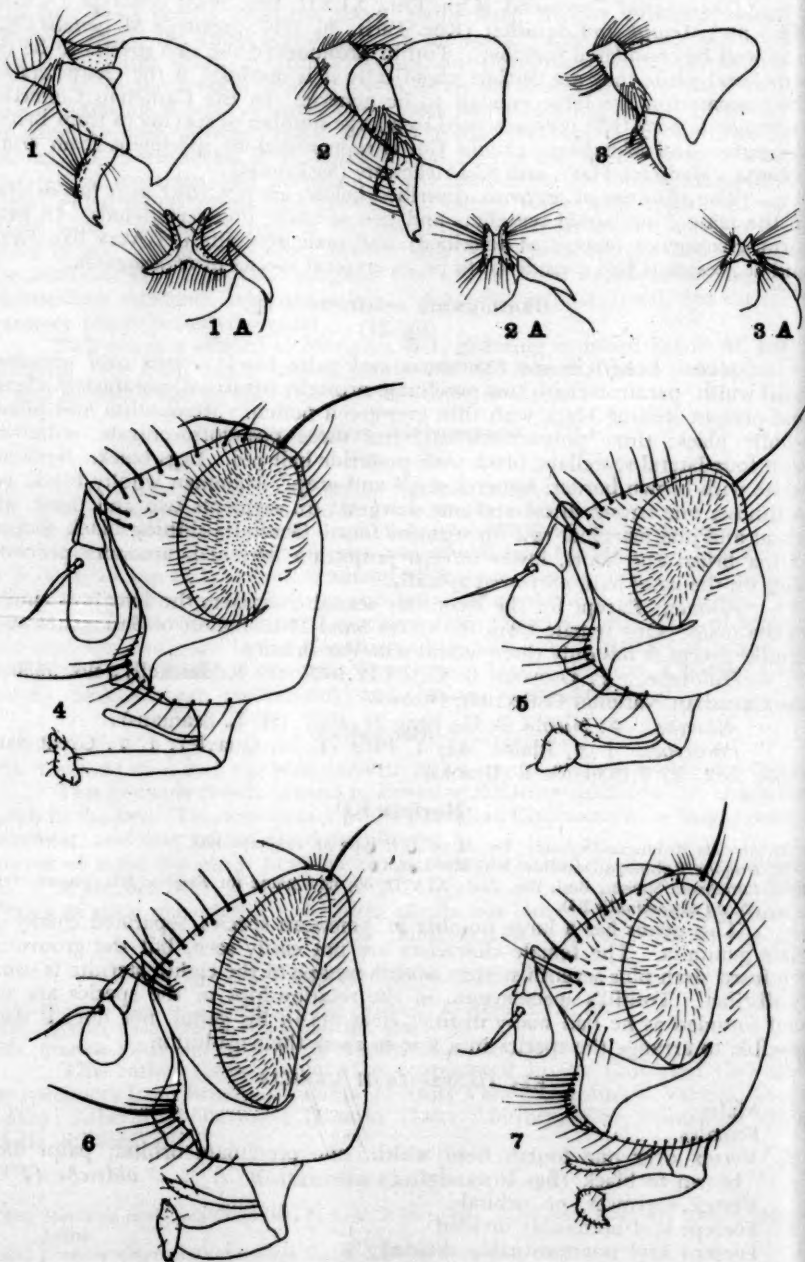
1903, *Varichaeta* Speiser, Berl. Ent. Zeit., XLVIII, 69; new name for *Erigone* RD. preocc.; type *Fausta abdominalis* RD.

This genus has a large number of American species, separated chiefly on male genitalia. The female characters are not easily seen, but the groove on the fused sixth plus seventh sternite and the shape of the eighth sternite is usually distinct. Tothill's speculations on the relationships of the species are not well founded as he had many distinct elements in his genus, nor does it seem possible to arrange the species in a line to show their evolution.

KEY TO SPECIES OF MERICIA

1. Males 2
- Females 16
2. Vertex over one fourth head width; one proclinate orbital; palpi dark brown to black (fig. 16) *aldrichi* (TT.)
- Vertex narrower, no orbitals 3
3. Forceps keel noticeably divided 4
- Forceps keel not noticeably divided 6
4. Forceps points very long and divergent; accessory process narrowed, genitalia black (fig. 1) *bicarina* (Tll.)

PLATE V.

CANADIAN SPECIES OF *ERNESTIA* SENS. LAT.

- Forceps points short 5
5. Genital segments usually red; accessory process narrowed apically (fig. 3) *ampelus* (Wlk.)
- Genital segments dark; accessory process wide for entire length (fig. 2) *alberta* Cn.
6. Genital segments red 7
- Genital segments dark 9
7. Palpi black (fig. 19) *manitoba* n. sp.
- Palpi brown or yellow 8
8. Vertex about one-sixth head width; two PRSA; fifth sternite with a V-shaped cleft; carina not heavy (fig. 14) *platycarina* (Tll.)
- Vertex one-fourth head width; one PRSA; fifth sternite with U-shaped cleft (fig. 12) *occidentalis* n. sp.
9. Palpi black 10
- Palpi brown or yellow 11
10. Fifth sternite with deep incision on the lateral margin of each of the two prongs; forceps slightly concave *incisa* (Tll.)
- Fifth sternite normal; forceps straight on edge (fig. 15) *nigropalpis* (Tll.)
11. Carina strongly concave on the upper edge, ending in a point; abdomen red on the sides of segments two and three 12
- Carina not strongly concave on the upper edge 13
12. Accessory process very wide for entire length and short; lower forceps projection short and heavy; abdomen heavily pollinose; bristles weak; red on abdomen extensive (fig. 10) *campestris* Cn.
- Accessory process widened at the base only, apical half narrow; lower forceps projection long, curved and thin; bristles stronger; pollen on median line thin (fig. 9) *arcuata* (Tll.)
13. Forceps carina acute triangular, the point about sixty degrees 14
- Forceps carina not acute triangular, the point obtuse 15
14. Carina very long and heavy; accessory process heavy entire length; lower forceps process long and curved; scutellum nearly black (fig. 18) *longicarina* (Tll.)
- Carina short and light; accessory process not heavy, narrowed apically; lower forceps process short and straight (fig. 8) *triangularis* Cn.
15. Carina convex on the upper edge; accessory process normal; lower forceps process very short and straight (fig. 13) *sulcocarina* (Tll.)
- Carina straight on the upper edge; accessory process very wide from base to apex; lower forceps projection curved (fig. 11) *johnsoni* (Tll.)
16. Fourth abdominal tergite red 17
- Fourth tergite black 18
17. Second antennal segment red; pollen of the abdomen heavy *ampelus* (Wlk.)
- Second antennal segment black *platycarina* (Tll.)
18. At least the apical half of the second antennal segment red; pollen thin *alberta* Cn.
- Antennae black 19
19. Fused sternites 6 and 7 with two deep grooves separated by a ridge; palpi yellow *bicarina* (Tll.)
- Fused sternite 6 and 7 with one groove and no ridge 20
20. Palpi black 21
- Palpi yellow 23
21. Sternal groove parallel-sided, deep, narrow, extending through the apex; eighth sternite with a wide V-shaped cleft at the apex *manitoba* n. sp.
- Not entirely so 22
22. Sternal groove very deep; tergites 6 and 7 wide, long and parallel-sided *aldrichi* (Tt.)?
- Sternal groove shallow; tergites 6 and 7 short *nigropalpis* (Tll.)

23. Sternal groove a deep narrow fissure; tergites 6 and 7 triangular
 campestris Cn. and *arcuata* (Tll.) 24
 Sternal groove wider and shallower 24
 24. Sternal groove shallow triangular, cup shaped; eighth sternite with a U-shaped cleft *sulcocarina* (Tll.) 25
 Sternal groove a shallow line; eighth sternite without a U-shaped cleft 25
 25. Front PRSA weak or absent *occidentalis* n. sp.
 Front PRSA strong; eighth sternite with a shallow V-shaped cleft sp.
 I have seen no females of *johnsoni*, *triangularis*, *longicarina* or *incisa*.
 The male *incisa* was placed on the description only.

***Mericia aldrichi* (Tl.)**

(fig. 16)

- 1892, *Hystieria aldrichi* Townsend, Trans. Amer. Ent. Soc., XIX, 91; male and female, South Dakota.
 1897, *Panzeria radicum* Coquillett in part, Rev. Tach., 88.
 1905, *Panzeria radicum* Aldrich in part, Ald. Cat., 453.
 1908, *Varichaeta aldrichi* Townsend, Tax. Mus. Flies, 109.
 1921, *Ernestia aldrichi* Tl. of Tothill, Can. Ent., 53:250.

This species is readily recognized in the male by the broad front, proclinate orbital, and large triangular forceps carina. The female is not so distinct from the other species, but it differs from the species with black palpi as in the key. Including one paratype the Canadian Collection has specimens from South Dakota (Brookings), Alberta (Lethbridge) Saskatchewan (Pheasant Creek).

***Mericia ampelus* (Wlk.)**

(fig. 3)

- 1849, *Tachina ampelus* Walker, List., IV, 732; Nova Scotia.
 1897, *Panzeria radicum* Coquillett in part, Rev. Tach., 88.
 1905, *Panzeria radicum* Aldrich in part, Ald. Cat., 453.
 1921, *Ernestia ampelus* Wlk. of Tothill, Can. Ent., 53:273.
 1931, *Ernestia ampelus* Wlk. of Aldrich, Proc. U. S. Nat. Mus., Vol. 80, art. 10, 9.

The species *ampelus* Wlk., *alberta* Cn. and *bicarina* Tll. form a group in which the forceps carina in the male is distinctly divided, *ampelus* and *alberta* being very closely allied. The separating characters of *alberta*, namely the narrower front and narrowed accessory processes, are variable, as is the redness of the genital segments. A few specimens of *ampelus* have entirely black genital segments. The red tip of the female abdomen also varies greatly in extent, being nearly absent in some specimens. In *ampelus* the abdominal pollinosity is usually heavy and dull especially in the female, and as can be seen from the figures the carina in *ampelus* is shorter and wider than that of *alberta*, as is also the lower forceps projection. The female antennae have the first and second segment wholly red. In the Canadian Collection *ampelus* is represented by a large number of specimens from New Brunswick, Quebec, Ontario, Manitoba, Alberta, and British Columbia.

***Mericia alberta* Cn.**

(fig. 2)

- 1924, *Mericia alberta* Curran, Ent. News, XXXV, 248; male and female, Banff, Alta.

The holotype male has the frontal bristles four or five below the antennae base, the vertex just over one-fifth head width and the genitalia wholly black. The female parafrons and parafacials are golden pollinose, and the first antennal segment plus the basal half of the second are black. The pollen of the abdomen is thin and rather shining. This species has been collected only in Alberta (Banff, Waterton).

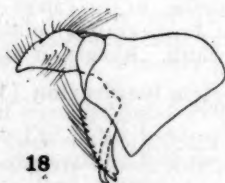
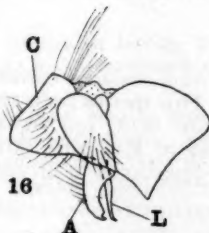
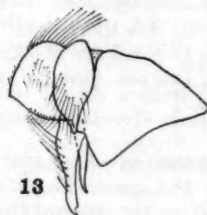
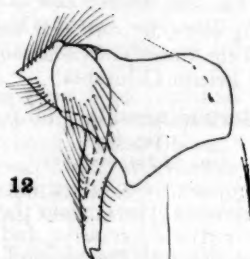
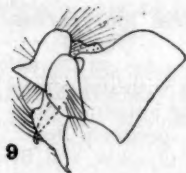
***Mericia bicarina* (Tll.)**

(fig. 1)

- 1921, *Ernestia bicarina* Tothill, Can. Ent., 53:272; male, B. C.

This species is readily recognized in the male by the deeply grooved

PLATE VI.



CANADIAN SPECIES OF ERNESTIA SENS. LAT.

forceps carina, and in the female by the double groove on sternites 6 and 7. This species ranges from New Brunswick, Ontario, Alberta to British Columbia.

***Mericia platycarina* (Tll.)**

(fig. 14)

1921, *Ernestia platycarina* Tothill, Can. Ent., 53:270; male, Great Falls, Va.

A rather common species with red genital segments. The female is much like *ampelus* but always has the antennae deep black. Including six paratypes the Canadian Collection has specimens from Nova Scotia, New Brunswick, Prince Edward Island, Quebec, Ontario, and British Columbia.

***Mericia nigropalpis* (Tll.)**

(fig. 15)

1921, *Ernestia nigropalpis* Tothill, Can. Ent., 53, 247; male, B. C.

In this species the wing veins are outlined with a darker shade, and the body and palpi are black. In the Canadian Collection are specimens from Nova Scotia, Quebec, Ontario, and British Columbia.

***Mericia arcuata* (Tll.)**

(fig. 9)

1921, *Ernestia arcuata* Tothill, Can. Ent., 53:248; male, Va.

The species *arcuata*, *campestris* and *triangularis* are very similar, all showing red on the sides of the abdomen. In *arcuata* the pollen on the mid line of the abdomen is thinner, the red less extensive and the bristles stronger. *M. arcuata* is a common species in Ontario, Quebec and the Maritimes.

***Mericia campestris* Cn.**

(fig. 10)

1924, *Mericia campestris* Curran, Ent. News, XXXV, 249; male, Aweme, Man.

This species bears the same relation to *arcuata* as *alberta* does to *ampelus* the carina being less arcuate, and the accessory processes wider. In Canada it is found in Manitoba, Alberta, and one specimen in the collection was taken with a long series of *arcuata* at Orillia, Ontario.

***Mericia triangularis* Cn.**

(fig. 8)

1924, *Mericia triangularis* Curran, Ent. News, XXXV, 247; male, Aweme, Man.

This species resembles *arcuata* and *campestris* in having the abdomen slightly red on the sides, differing in the carina being not at all arcuate, but short triangular. Compared by Curran to *aldrichi* but evidently not close; the vertex is one-fifth head width. Ranges in Manitoba and Ontario.

***Mericia longicarina* (Tll.)**

(fig. 18)

1921, *Ernestia longicarina* Tothill, Can. Ent., 53:251; male, Lake Tahoe, Cal.

The male genitalia of this species are an easily recognized landmark. I have seen specimens only from Lake Tahoe.

***Mericia johnsoni* (Tll.)**

(fig. 11)

1921, *Ernestia johnsoni* Tothill, Can. Ent., 53:229; male, Wellesley, Mass.

This species is rare in Canada and the collection has but one specimen, a paratype from Fry Creek, B. C. This has the parafrons and parafacials golden pollinose and the vertex about one-fifth head width.

***Mericia sulcocarina* (Tll.)**

(fig. 13)

1921, *Ernestia sulcocarina* Tothill, Can. Ent., 53:271; male, Lillooet, B. C.

Said by Tothill to be the connecting species between the forked carina group (*ampelus*, *alberta* and *bicarina*) and the others, but this point appears

doubtful as the carina is strongly convex on the outer surface. Ranges in Canada in Ontario, Alberta and British Columbia.

***Mericia manitoba* n. sp.**
(fig. 19)

Male. Length 10 mm. Antennae and palpi deep black; vertex about one-ninth head width, no orbitals; parafacials, parafrons, cheek and occiput grey pollinose, cheek groove deep golden. Mesonotum grey pollinose with four longitudinal darker vittae; two PRSA; three postacrostichals and three postdorsocentrals; scutellum red tipped. Cubitulus of wing with a short stump; wing clear; squamae white, the upper one with a dark brown edge. Legs black. Abdomen blue-black with thin pollen over the whole surface; bristles strong, one marginal and one discal on segment two, one discal and marginal row on segments three and four. Genitalia and fifth sternite yellow; forceps carina short and broad; accessory processes tapered from base to apex; fifth sternite cleft a shallow V.

Female. Genital segments black; sternites 6 and 7 with a deep parallel-sided groove which extends through the apex; 8th sternite deeply cleft. The scutellum of the single specimen is wholly black.

Holotype. ♂, Aweme, Man., 10.VII.1925 (N. Criddle); no. 5328 in the Canadian National Collection, Ottawa.

Allotype. ♀, Teulon, Man., 17.VII.1923 (A. J. Hunter):

***Mericia occidentalis* n. sp.**
(fig. 12)

This species is distinct from the rest of the species in having the front PRSA absent or merely hair-like, and the vertex of the male one-fourth the head width.

Male. Length 12 mm. Vertex one-fourth head width, no orbitals; frontals five below the antennae bases, more or less doubled below; parafacials equibroad, nearly two-thirds clypeal width; antennae black; palpi yellow; parafrons, parafacials and cheeks golden pollinose, occiput grey. Mesonotum grey pollinose with four dark vittae, scutellum subshining black, pleura black; one PRSA. Legs black. Wings clear, veins dark, no stump at the cubitulus; squamae white. Abdomen grey pollinose with the posterior one-fourth of segments shining black; one discal and one marginal on segments two and three, one discal and marginal row on segment four. Genital segments dark red, fifth sternite, forceps, and accessory processes black; carina short triangular, widened and with a dent (as in *sulcocarina*); accessory processes long, broad to apex; cleft of fifth sternite a deep V.

Female. Vertex about one-third head width. Similar to male in having the front PRSA absent or hair like. First hypopygial segment red; fused sternites 6 and 7 with a long narrow groove from base to apex; eighth sternite not cleft, truncate at the tip and with a deep groove.

Holotype. ♂, Creston, B. C., 28.V.1926 (A. A. Denny); no. 5329 in the Canadian National Collection, Ottawa.

Allotype. ♀, Hedley, B. C., 29.VIII.1923 (C. B. Garrett).

EXPLANATION OF PLATES V. AND VI.

1, *Mericia bicarina* Tll., lateral view of male genitalia. 1A, *Mericia bicarina*, dorsal view of forceps. 2, *Mericia alberta* Cn., male genitalia. 2A, *Mericia alberta*, dorsal view of forceps. 3, *Mericia ampelus* Wlk., male genitalia. 3A, *Mericia ampelus*, dorsal view of forceps. 4, *Promericia fasciventris* Cn., male head. 5, *Appendicia frontalis* Tll., male head. 6, *Mericia arcuata* Tll., Male head. 7, *Pseudomeriania nigrocornea* Tll., male head. 8, *Mericia triangularis* Cn., male genitalia. 9, *Mericia arcuata* Tll., male genitalia. 10, *Mericia campestris* Cn., male genitalia. 11, *Mericia johnsoni* Tll., male genitalia. 12, *Mericia occidentalis* n. sp., male genitalia. 13, *Mericia sulcocarina* Tll., male genitalia. 14, *Mericia platycarina* Tll., male genitalia. 15, *Mericia nigropalpis* Tll., male genitalia. 16, *Mericia aldrichi* TT., male genitalia.

(A=accessory process, L=lower forceps projection, C=carina). 17, *Promerica fasciventris* Cn., male genitalia. 18, *Merica longicarina* Tll., male genitalia. 19, *Merica manitoba* n. sp., male genitalia. 20, *Appendicia frontalis* Tll., male genitalia. 21, *Ohanagania setifrons* n. sp., male genitalia. 22, *Pseudomeriania nigrocornea* Tll., male genitalia.

NOTE

THE INFLUENCE OF LEGUMINOUS PLANTS ON THE ABUNDANCE OF TARNISHED PLANT BUG

Spray applications and cultural practices cannot be relied upon to prevent injury by the tarnished plant bug to buds of apple and pear. The same is true regarding damage to peach fruits, commonly referred to as "catfacing". The damage is caused by mature insects which survive the winter and emerge from their hibernating quarters to feed upon buds and fruits early in the year. The bugs are especially abundant in orchards with permanent cover crops of either red clover, sweet clover or alfalfa.

The following briefly summarizes results of experiments undertaken in 1936 and 1937 to determine the influence of various types of leguminous cover crop plants on the abundance of tarnished plant bug. Three plots measuring 60 by 20 feet were seeded to red clover, alfalfa and white Dutch clover. Small plots were used in order that a pure stand of each plant could be maintained, and to minimize the variables due to soil and topography. The plots were hand-weeded twice. Three irrigations were applied. There was no disturbance of the plants other than that incidental to sampling. In 1936 the plots were sampled twice, once in September and once in October. In 1937 samples were taken each week between June and November. Each sample was taken by three sweeps of an 18-inch net.

Total Tarnished Plant Bugs Collected

	Insects Collected	
	1936	1937
Red Clover	261	725
Alfalfa	71*	768
White Dutch clover	24	429

While the table shows that the tarnished plant bug population on red clover and alfalfa was considerably greater than on white Dutch clover, it does not indicate the comparative abundance of the insects during late fall, a few weeks prior to their entering hibernation. At this time the insects have a strong tendency to congregate upon the flower heads of alfalfa, red clover and other tall flowering plants. Eight collections made between September 1 and November 1 yielded 204 insects on red clover, 177 on alfalfa and 54 on white Dutch clover. None were taken on the latter plant between October 8 and November 1, although ten to fifteen tarnished plant bugs occurred in each sample on the other two plots. The scarcity of tarnished plant bugs on white Dutch clover is probably due to the low-growing habit of the plant and the relatively high humidity maintained in late fall beneath the dense matted growth.

The use of white Dutch clover as a cover crop in orchards which are subject to tarnish plant bug attack may be worth considering.

E. P. Venables and D. B. Waddell,

Vernon, B. C.

*Alfalfa not in bloom in 1936, hence not particularly attractive.

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